Army Regulation 700–68
DSAR 4145.25
NAVSUPINST 4440.128B
MCO 10330.2B
AFR 67-12

STORAGE AND HANDLING OF COMPRESSED GASES AND GAS CYLINDERS

Headquarters
Departments of the Army, Defense Supply Agency Department of the Navy Marine Corp Office Department of the Air Force
Washington, DC
2 September 1971

Unclassified

SUMMARY of CHANGE

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STORAGE AND HANDLING OF COMPRESSED GASES AND GAS CYLINDERS

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

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Executive

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I. PURPOSE AND SCOPE.

To prescribe policy, responsibilities, and procedures to be followed in the storage, handling, and quality surveillance of compressed or liquefied gases and gas cylinders, so that optimum use of such items can be obtained by DSA customers. This regulation is applicable to HQ DSA, Defense Supply Centers (DSCs) with depot operations, Defense Depots and the Army, Navy, Air Force, and Marine Corps storage sites that receive, store, issue, maintain, and perform associated services in connection with DSA–owned compressed gases and, gas cylinders; it also covers gases and gas cylinders under management control of the Defense General Supply Center (DGSC) and the Defense Personnel Support Center (DPSC). It has been coordinated with, and concurred in by the Army, Navy, Air Force, and Marine Corps.

II. POLICY.

It is the policy of HQ DSA that all compressed gases and gas cylinders in the DSA distribution system are classified uniformly as to condition status, that storage practices are such as to maintain serviceability with a minimum of cost expenditure, and that products that are delivered to customers are satisfactory in all respects for their intended use.

III. BACKGROUND

a. Prior to acceptance by the Government, compressed gas cylinders and/ or their contents are inspected by Government personnel to determine compliance with contractual requirements. On DGSC gases, specification testing is performed at the supplier's facility by supplier's personnel under the surveillance of a Government representative. For DPSC gases, records of examination, and tests that are performed by the supplier and/or vendor, to substantiate conformance of supplies to specification requirements, are maintained by the supplier and will be made available to the Government, upon the Government's request. Inspection and/or supplier verification testing is conducted under the surveillance of a Government Quality Assurance Representative. Once the quality of gas within a cylinder has been established, that quality will continue so long an a positive pressure is maintained within the cylinder under normal storage conditions. Consequently, retesting of the gas at periodic intervals during storage is not necessary. Degradation of the cylinder condition can occur and procedures for prevention or detection of such degradation are defined in this regulation.

b. New cylinders are given a rigid inspection at the time of procurement, and must meet both U. S. Department of Transportation (DOT) and Federal specifications. The supplier's fabrication and testing are performed under the surveillance of a Government Representative. After cylinders are accepted into the DSA supply system, they may remain for relatively long periods of time in an empty condition, or may be sent to a commercial firm that specializes in compressed gases, for filling. In either event, prior to filling, the contractor is required to rehabilitate the cylinder as necessary to maintain it in a safe and serviceable condition. This rehabilitation includes painting to the proper color code, hydrostatic testing when necessary, valve replacement or repairs, and interior cleaning when necessary. Thus cylinders that are in constant use are apt to remain in much better condition than those in inactive storage. New cylinders that have never been filled present more difficult long term storage problems as, owing to the absence of positive internal pressure, they may breathe moisture from the atmosphere. This regulation defines methods and procedures for preventing or determining the extent of degradation in empty cylinders.

c. It is important that certain safety precautions are exercised in the storage, handling, and use of compressed gases. These precautions are stipulated in various Military Departmental publications and in the joint manual designated as DSAM 4145.1/TM 743–200/ NAVSUP Pub 284/AFM 67–3/ NAVMC 1101, Storage and Materials Handling. Some of these precautions are restated in this regulation. Guidance and additional information should be obtained from the local safety office.

d. Painting and color coding of cylinders are defined in Military Standard MIL–STD–101, Color Codes for Pipelines and Compressed Gas Cylinders.

e. Cleaning, internal and external, is performed by the commercial supplier at the time of filling; however, external cleaning might become necessary during depot storage. See Enclosure 1, section VI.

IV. RESPONSIBILITIES

a. The Chief, Depot Operations Division, Executive Directorate, Supply Operations, HQ DSA (DSAH–OW) is responsible for:

(1) Monitorship and staff supervision of the DSA program for the storage, handling, and use of compressed gases and gas cylinders.

(2) Maintaining this regulation in a current status and reviewing it annually.

b. Field Activities

(1) Commanders of DGSC and DPSC are responsible for:

(a) Ensuring the quality of compressed gases and gas cylinders that are procured or managed.

(b) Providing guidance as needed to depot activities that handle these items to perpetuate a constant quality control program.

(c) Reviewing the quality control and related technical aspects of this regulation annually and, in collaboration with DSAH–OW, maintaining appropriate constituent parts in a current status.

(2) *Commanders of DSCs With Depot Operations, Defense Depots, and the Army, Navy, Air Force, and Marine Corps Storage Sites That Furnish Special Support to DSA* are responsible for:

(a) Implementing the requirements of this regulation.

(b) Conducting inspections as required herein, and maintaining concise records of such inspections.

(c) Assigning condition codes and reporting in accordance with this regulation.

V. PROCEDURES

a. The compressed gas cylinder is a unique item in the DSA supply system. Policies and procedures that apply to cylinders differ somewhat from those that govern other commodities. Aside from the inherent physical characteristics that are peculiar to this commodity group, these materials are controlled rigidly by both industrial and Government agencies outside the Department of Defense.

b. Personnel who handle compressed gas cylinders must be cognizant of the characteristics and physical dangers that are associated with compressed gases, and of the statutes and regulations that control the inspection storage, shipment, and disposal of filled and empty cylinders. Adherence to the procedures and precautions as set forth in this regulation will assure compliance with the requirements of DOT and the Bureau of Explosives (Association of American Railroads), and the recommendations of the Compressed Gas Association, as well as pertinent provisions of applicable DSA and Military Service publications.

c. Detailed procedures are outlined in Enclosures 1 and 2. Enclosure 1 applies to DGSC items, and Enclosure 2 covers DPSC items. Condition codes as prescribed in Enclosure 1 are defined in DSAM 4140.2, Volume 1, Supply Operations Manual, Distribution System Procedures.

Section

STORAGE AND HANDLING OF COMPRESSED GASES AND GAS CYLINDERS UNDER MANAGEMENT OF DGSC

Section I
INTRODUCTION

1.1. General.

DSAM 4145.1, Chapter 5, Section IV, provides some of the information that is needed for depot guidance in the gas and cylinder program. However, certain supplementary instructions are required, such as procedures for storage, handling, inspection, classification,

maintenance and disposal of filled and empty cylinders. These procedures are provided herein.

1.2. Coverage of Gases and Cylinders.

It is important to note that only the gases that are most likely to be handled in depot operations are considered in this regulation. There are numerous other compressed gases in the military system, some of which are extremely hazardous. Should cylinders of any gas that is not mentioned specifically in this regulation be encountered, they will be set aside and assigned to Condition Code J or K as applicable, and reported to DGSC in accordance with DSAM 4140.2, Volume I, and section X of this regulation.

1.3. U. S. Department of Transportation (DOT).

As of April 1967, the U. S. DOT assumed all of the regulatory functions for compressed gases and gas cylinders that were formerly under the Interstate Commerce Commission (ICC). Reference is made herein to DOT with the understanding that cylinders, labels, and tags now in the system will maintain their ICC identification.

Section II
CHARACTERISTICS OF GASES

2.1. In handling cylinders and using gases, personnel should have knowledge of some of the characteristics of the particular gas in question. Characteristics of individual gases are delineated in DSAM 4145.3/TM 38–250/AFM 71–4/NAVAIR 15–03–500/MCO P4030.19, Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft. The gases that are most likely to be encountered in DSA storage and support facilities are listed below. For reference, the required DOT tag for each gas is indicated.

a. Acetylene (DOT Red Flammable Gas Tag). Acetylene is highly flammable and, when mixed with air, is highly explosive. The cylinders should be used and stored in an upright position. If they have been stored in a horizontal position, they must stand upright for a minimum of two hours prior to use. Acetylene should never be used at a pressure in excess of 15 pounds per square inch (psi); higher pressure may cause it to explode. Owing to its explosiveness, sparks, and flame must be kept away from the cylinders, and the acetylene must never be allowed to escape into an enclosed area. Acetylene in moderate concentrations may act as an intoxicant. In higher concentrations, it will cause unconsciousness, and ultimately, asphyxiation. CAUTION: Some grades of commercial acetylene may contain highly toxic impurities; consequently, breathing of acetylene gas in any concentration for any length of time must be avoided.

b. Air, Compressed (DOT Green Gas Tag). Compressed air is generally inert; however, it does contain about 20 percent oxygen and should be used and handled with due respect for its ability to support and intensify combustion.

c. Ammonia (DOT Green Gas Tag). Ammonia in light concentrations is extremely irritating to the eyes, skin, and mucous membranes. In heavier concentrations, it can be fatal. It is explosive in mixtures of 16 to 24 percent by volume in air. Liquid ammonia is extremely dangerous; it will freeze and cause caustic burns on contact.

d. Argon (DOT Green Gas Tag). Argon is nonflammable and nontoxic, and will not support combustion. High concentrations in a confined area may displace air and cause suffocation.

e. Carbon Dioxide (DOT Green Gas Tag). Carbon dioxide is much heavier than air; it is nonflammable, and does not support combustion. Carbon dioxide, if blown directly on the body, may cause a "cold" burn. High concentrations in a confined area will replace air and cause suffocation.

f. Carbon Monoxide (DOT Red Flammable Gas Tag). Carbon Monoxide is both toxic and flammable. It is particularly dangerous when pure, because it is odorless and colorless. Prolonged breathing of even very light concentrations produces headaches. Heavier concentrations will cause sudden unconsciousness, and may be fatal.

g. Chloro/Fluoro–hydrocarbons (DOT Green Gas Tag)

(1) As used throughout this regulation, this term applies to the various refrigerant gases described in Federal Specification BB–F–1421.

(2) These gases are heavier than air, are nonflammable, do not support combustion, and are considered relatively nontoxic. Prolonged breathing of moderate concentrations can irritate the nose and throat, and may produce lethargy. High concentrations in a confined area can replace air and cause suffocation.

h. Chlorine (DOT Green Gas Tag). Chlorine is a greenish–yellow gas; it is much heavier than air, and is not combustible; however, it reacts rapidly with many substances and may cause fire or explosion in contact with them. It must be handled with extreme caution and kept away from flammable liquids and gases or other substances that are easily ignited. Adequate ventilation must always be provided when chlorine is used. Chlorine gas in relatively light concentrations will irritate the eyes, nose, throat, lungs, and the skin. Heavier concentrations will cause severe and sometimes permanent damage to the respiratory tract. Liquid chlorine will cause severe burns on contact.

i. Chlorine Trifluoride (DOT White Corrosion Liquid Tag). Chlorine Trifluoride is both highly toxic and flammable. It will cause severe irritation of the eyes, nose, and throat even in very low concentrations. It is liquid at temperatures below 55 degrees fahrenheit (F). Special precautions are required when handling cylinders of Chlorine Trifluoride. (See section V.)

j. Ethylene Oxide (DOT Red Flammable Liquid Tag). Ethylene oxide is one of the more hazardous materials in Federal Supply Class (FSC) 6830. It is both toxic and highly flammable. It is particularly dangerous because exposure to even very low concentrations tends to dull the senses. In its container (it is shipped in both cylinders and drums), ethylene oxide exists as a liquid under its own low pressure. Liquid ethylene oxide will cause severe burns on contact with the skin. (See section V for special precautions in handling this material.)

k. Helium (DOT Green Gas Tag). Helium is much lighter than air, is nonflammable, and does not support combustion. High concentrations in a confined area may displace air and cause suffocation.

l. Hydrogen (DOT Red Flammable Gas). Hydrogen is highly combustible, and must be kept at a safe distance from sparks and flame. When mixed with air or oxygen, it becomes highly explosive. It is nontoxic and dissipates rapidly in air.

m. Liquefied Petroleum Gas (LPG) (DOT Red Flammable Gas Tag). LPG, such as butane and propane, are flammable and must not be stored with oxygen cylinders or flammable substances. When in use, supply containers must be located outside the building and piped to points where the gas is used. The gases are relatively nontoxic, but may act as an anesthetic. They are heavier than air.

n. MAPP Gas (DOT Red Flammable Gas Tag)

(1) A relative newcomer to industrial fuel gases, MAPP gas (Methyl–Acetylene–Propadiene–Propylene), has been approved for use in the Military Supply system.

(2) MAPP gas, in general, is similar to propane with respect to flammability, and has toxic properties similar to those of acetylene. However, its strong characteristic odor can usually be detected at levels well below the point at which they become dangerous.

(3) Since the cylinders used for MAPP gas are identical to those currently used for liquefied petroleum gases (propane–butane), it is possible that "empty" cylinders may be received at depots as customer returns. For this reason, guidance in handling the material is included in this regulation. (See section VII.)

o. Methyl Bromide (DOT Poison Gas Tag). Methyl bromide is not normally carried in stock in compressed gas cylinders. However, it is used by the Military Services, and "empty" cylinders may be returned to depots.

(1) Methyl Bromide is highly toxic and, within a very limited range, is flammable. It is particularly hazardous for several reasons. First, its odor is not unpleasant and can be tolerated. Second, the symptoms experienced as a result of toxic exposure may not become apparent for several hours, or even days, after exposure has occurred.

(2) Also, methyl bromide is normally a liquid, even in cylinders, and produces only a relatively low gas pressure when the valve is opened. Methyl bromide liquid will cause severe burns on contact with the skin.

p. Methyl Chloride (DOT Red Flammable Gas Tag). Methyl chloride is both toxic and flammable. Care must be exercised when working with or around cylinders of methyl chloride, since its odor is mild and not unpleasant (sweet, ether–like). Overexposure to the gas is possible without immediate, apparent effects. Repetitive or prolonged exposure to any concentrations of methyl chloride must be avoided. Also, in light concentrations, the gas becomes explosive, somewhat similar to acetylene. When subjected to flame temperatures, methyl chloride decomposes to more toxic gases.

q. Nitrogen (DOT Green Gas Tag). Nitrogen has approximately the same density as air, is nonflammable, and does not support combustion. Nitrogen is divided into two subclasses: "oil–free" and "oil–tolerant." The former indicates that the compressor used in manufacture was lubricated with water or liquid gas to prevent possible contamination with oil. Oil tolerant nitrogen must not be used in conjunction with oxygen. High concentrations of nitrogen in a confined area can displace air and cause suffocation.

r. Oxygen (DOT Green Gas Tag). Oxygen is nonflammable but supports combustion intensely. It must not be stored or used near flammable materials or gases. Oil or grease must never be allowed to come into contact with oxygen cylinders, valves, regulators, gauges, or fittings.

s. Sulfur Dioxide (DOT Green Gas Tag). Sulfur dioxide is nonflammable. but is extremely toxic and infectious to the eyes. nose, and throat. It will irritate other moist areas of the body.

t. Sulfur Hexafluoride (DOT Green_Gas Tag). Sulfur hexafluoride is chemically inert in a pure state but, it not of high, purity, can contain other sulfur fluorides that are toxic. High concentrations in a confined area may displace air and cause suffocation.

Section III
CHARACTERISTICS OF CYLINDERS

3.1. Cylinder Types

a. Cylinders, including those of new manufacture, continue to bear ICC markings and, until amendment to DOT regulations, such markings will remain in use. Compressed gas cylinders under management of DGSC are of three basic types, ICC 3, ICC 4, and ICC 8, identified by the following ICC specifications stamped on the shoulder of the cylinder: ICC 3A, ICC 3AA, ICC 4A, ICC 4AA, ICC 4B, ICC 4BA, ICC 4BW, ICC 8, and ICC 8AL. Each of these specifications will be followed by a number to indicate the rated service pressure, psi, of the cylinder, e. g., ICC 3A 2015.

b. In most instances cylinders of a given basic type may be interchanged with others of the same type. For instances, ICC 3A and ICC 3AA cylinders are completely interchangeable. ICC 4B, 4BA, and 4BW are also interchangeable.

c. In the Military Supply system, the ICC 4A and 4AA cylinders are used specifically for AMMONIA and should not be substituted for or by any other ICC 4 type cylinder unless such is requested by DGSC.

d. The ICC 8 and ICC 8AL cylinders are unique. These cylinders are packed with a porous material that, even when cylinders are empty, makes them much heavier than would be expected. They are used exclusively for ACETYLENE.

e. While many other ICC specification cylinders are available, DGSC does not catalog and use them at present. Cylinders that are found with an ICC designation other than the above will be reported in accordance with section X.

f. The small aerosol type containers currently in the DoD Supply System are exempt from DOT regulations governing compressed gases by reason of their size, i. e., not greater than one quart capacity and do not exceed 170 psi, hence are not considered in this regulation. However, such containers are regulated for ocean shipment in accordance with 49CFR–173.306.

3.2. Cylinder Sizes

a. Unfortunately, the physical dimensions; i. e., diameter and height, of cylinders currently in the system are not standard for any given capacity. This is particularly true of types ICC 4 and ICC 8.

b. Because of this, a variation of the cylinder dimensions up to ± 2 inches in diameter and 6 inches in height from the catalog description for ICC 4 and ICC 8 cylinders is considered acceptable, EXCEPT where the cylinder is designated for a specific end use (e. g., FSN 8120–063–3983). Cylinders identified to such FSNs must have the specified dimensions within tolerances of ± one inch in height.

c. This problem is not so acute with ICC 3 type cylinders. Tolerances on these cylinders should not exceed ± ½ inch diameter or ± one inch in height from the catalog description.

NOTE: For other than transportation purposes, height of cylinders is always measured from the bottom to the top of the neckring or spud; valves or cylinder caps are not to be included in measuring the height.

d. Most of the ICC 4 and ICC 8 cylinders that are not designated for a specific end use in which the size is critical may be identified only as to their capacity. This will permit consolidation of variously–shaped cylinders, with the same capacity for a given gas, under one FSN.

3.3. Cylinder Pressures

a. Cylinders of the same type (or interchangeable as noted above), with a greater service pressure, may be substituted for a specified cylinder of lower pressure, provided the prescribed valve is the same for both cylinders.

b. For certain gases which are filled by weight, the working pressure of the cylinder is immaterial provided it exceeds the minimum rated pressure prescribed by law. These gases, with the types of cylinders normally used by the Military, and the minimum pressure required are listed below:

Table 3–3

Gas	DOT (ICC) Spec.	Minimum Pressure
Acetylene	8, 8AL	250
Ammonia	4, 4A, 4AA	480
Carbon Dioxide (Nonmedical) *For medical gases; see Enclosure 2.*	3, 3A, 3AA	1800
Chlorine	3, 3A, 3AA	480
Chloro/Fluoro–hydrocarbons (except those listed immediately below)	4B, 4BA, 4BW	225
Chlorodifluoromethane	4B, 4BA, 4BW	240
Chlorotrifluoromethane	3A, 3AA	1800
Chlorotrifluoroethylene	4B, 4BA, 4BW	300
Liquefied Petroleum Gases	4B, 4BA, 4BW	240
MAPP Gas	4B, 4BA, 4BW	240

Table 3–3
—Continued

Gas	DOT (ICC) Spec.	Minimum Pressure
Methyl Chloride	3A, 3AA, 4B, 4BA, 4BW	225
Nitrous Oxide (Nonmedical) *For medical gases; see Enclosure 2.*	3A, 3AA	1800
Sulfur Dioxide	3A, 3AA, 4B, 4BA	225
Sulfur Hexafluoride	3A, 3AA	1000

c. When considering cylinders of the above gases, it is necessary only that the type (DOT Specification); minimum pressure; and capacity (i.e., size, see paragraph 3.2 b and 3.2 c above) apply. Hence cylinders of varying types, pressures, and dimensions (within stated 1imits), may be identified to a single FSN.

d. Every effort should be made to assign an FSN within the parameters listed for the above gases/cylinders before referring cylinders to DGSC for identification.

e. Other "high pressure" cylinders, ICC 3A and 3AA, with service pressures of 1800 psi or greater, will vary in capacity with the service pressure, and should not be substituted without authorization of DGSC.

f. Certain cylinders identified as ICC 3A2000, ICC 3AA2000, ICC 3A2260, and ICC 3AA2260 will be noted to have a + sign following the hydrostatic test date; i. e., 12–67+. These cylinders have been specially tested and modified to permit overfilling by 10 percent of their rated capacity. Consequently, the 2000 psi cylinders may be picked up and issued under the FSN applicable to the 2015 psi cylinder for that gas. Similarly, 2260 psi cylinders may be handled as the comparable 2265 psi cylinders.

3.4. Nonshatterable Cylinders

a. The term "nonshatterable" as used herein refers only to cylinder types ICC 3A and 3AA. This designation is not considered applicable to cylinder types ICC 4 or ICC 8.

b. Nonshatterable cylinders are identified specifically in the FSC C8120–IL catalog. Cylinders that are not so designated may be either "shatterable" or "nonshatterable."

c. Many nonshatterable cylinders are identified by the words NONSHATTERABLE, NONSHAT, or SHATTERPROOF stamped (not stenciled) on the shoulder or side of the cylinder. In other instances, nonshatterable cylinders can be identified as follows:

(1) All cylinders marked ICC 3AA.

(2) Cylinders with any of the following specification numbers stamped on the shoulder:

SPS 843 (INT)
SPS 1022 (INT)
51–C–26 and 51–C–26 (INT)
51–C–41 and 51–C–41 (INT)

(3) Cylinders that are marked with specification 51–C–31 or 51–C–31 (INT) are also nonshatterable if the initial (earliest) hydrostatic date is 6 – 44 or later. Cylinders of this specification that are dated prior to 6 – 44 are nonshatterable only if they are so stamped.

d. Cylinders that are not identified by any of the above markings will not be classified and identified (by FSN) as nonshatterable.

e. Changes in FSNs or condition codes that result from reidentifying cylinders in accordance with the above will be reported to DGSC in accordance with DSAM 4140.2, Volume I, except that the DD Form 1225, Storage Quality Control Report, is not required.

f. Substitution of a "shatterable" for a "nonshatterable" cylinder is not authorized unless specifically requested by DGSC.

3.5. Color Coding

a. Personnel who handle compressed gas cylinders must be familiar with the color coding of cylinders as shown in Military Standard, MIL–STD–101.

b. Color coding is provided as a hazard warning, and should not be used by itself to identify the contents of a cylinder. In the event of conflict with other markings, or doubt as to contents, the matter should be referred to DGSC in accordance with section X.

3.6. Hydrostatic Test Dates

a. Compressed gas cylinders must not be refilled if the hydrostatic test date has expired. This date, expressed by month – year, e. g., 6 – 62, is stamped on the shoulder of the cylinder each time the cylinder is retested.

b. The hydrostatic test date is considered as having expired if the latest date stamped on the cylinder precedes the current date by more than the period indicated below:

Table 3–6

Cylinder Type	Retest Period
ICC 3A and 3AA (all pressures)	5 years
ICC 3A. 3AA, 4A, and 4AA used in ammonia service	10 years
ICC 4A and 4AA (other than ammonia cylinders)	7 years
ICC 4B, 4BA, or 4BW (except as noted below)	12 years
ICC 4B, 4BA, or 4BW (when used for Bromotrifluoromethane, Ethylene Oxide or Sulfur Dioxide)	7 years
All cylinders, when the letter "E" follows the last hydrostatic test date	5 years

c. Cylinders that do not exceed two inches in outside diameter, and that are less than two feet long, and cylinders that are designated ICC 3E, ICC 4c, and ICC 8, or 8AL, are exempt from retest.

d. The retest date applies only to refilling empty cylinders. Filled cylinders are considered serviceable regardless of the last hydrostatic test date.

e. DoT is currently extending the retest period for certain cylinders. However, controls required over such cylinders are not considered feasible within the DoD supply system. The retest periods stated above will be maintained for Government–owned cylinders.

f. IMPORTANT: Cylinders that were last tested hydrostatically in any foreign country except Canada cannot be put into Continental United States (CONUS) service until they have been retested in this country in accordance with DOT requirements.

3.7. Cylinder Valves

a. These are critical to cylinder (and consequently FSN) identification. Inspection to assure the proper valve outlet is essential.

b. Information on the proper valve outlets for each gas is provided in the National Bureau of Standards publication, Handbook H–28, Screwthread Standards for Federal Services, Part II, Table

IX, and referenced Figures. This publication is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20401.

c. In many instances and for many reasons the valves installed in Government cylinders may not always conform to the latest revision of Military Specification MIL–V–2, Valve, Cylinder, Gas, for Compressed or Liquefied Gases, General Specification For. To preclude wholesale replacement, it has been determined that, if the valve is in working condition, and has the proper screw–thread outlet for the gas designated, it may be accepted for continued service. If there is no visible damage to the valve or any of its parts, and the valve can be opened and closed by hand, it may be assumed that the valve is in working condition.

d. To determine the suitability of the valve outlet when it cannot be identified positively by visual inspection, it is recommended that a plug or cap from a known valve be tried in or on the outlet. Owing to the similarity of outlets for several gases, plugs or caps would be required only for the following valve outlet types:

Table 3–7

Gas	OCA Valve Outlet
Acetylene	No. 201 .625' – 20NGO–RH–EXT
Anhydrous Ammonia	No. 241 .375' – 18NGT–RH–INT
Helium–Oxygen Mixture (Medical)	No. 281 .745' – 14NGO–RH–EXT
Ethyl Chloride	No. 301 .825' – 14NGO–RH–EXT (Conical Nipple)
Carbon Dioxide	No. 321 .825' – 14NGO–RH–EXT(Flat Nipple)
Carbon Monoxide Carboxide Ethyleneoxide – Carbon Dioxide Hydrogen	No. 351 .825' – 14NGO–LH–EXT
Acetylene Butane Butane–Propane Mixture Ethylene oxide Propane MAPP	No. 511 .885' – 14NGO–LH–INT
Oxygen	No. 541 .903' – 14NGO–RH–EXT
Argon (Oil Free) Helium (Oil Free) Nitrogen (Oil Free) Neon (Oil Free) Xenon (Oil Free)	No. 581 .965' – l4NGO–RH–INT
Air (Industrial (Oil Tolerant)) Helium (Oil Tolerant) Nitrogen (Oil Tolerant) Sulphur Hexafluoride	No. 591 .965' – 14NGO–LH–INT
Aersol Bromochloromethane Bromotrifluoromethane Dichlorodifluoromethane Dichlorotetrafluoroethane Methyl Bromide Methyl Chloride Monochlorodifluoromethane Sulphur Dioxide	No. 621 1.030' – 14NGO–RH–EXT (Flare converter)
Phosgene	No. 641 1.030' – 14NGO–RH–EXT (NGT Converter)
Chlorine	No. 661 1.030' – 14NGO–RH–EXT (NUT)
Oxygen (Medical)	No. 871 Yoke outlet, Pins 2 and 5
Helium–Oxygen Mixture (Medical)	No. 891 Yoke outlet, Pins 2 and 4
Nitrous Oxide (Medical)	No. 911 Yoke outlet; Pins 3 and 5
Cyclopropane (Medical)	No. 921 Yoke outlet, Pins 3 and 6
Carbon Dioxide (Medical)	No. 941 Yoke outlet, Pins 1 and 6
Air (Human Respiration) (Medical)	No. 951 Yoke outlet, Pins 1 and 5
Nitrous Oxide	No. 1321 .825' – 14NGO–RH–EXT (Small Round Nipple)

Table 3–7 —Continued

Gas	OCA Valve Outlet
Air (Human Respiration) (Oil Free)	No. 1341 .825' – 14NGO–RH–EXT (Large Round Nipple)

e. It will be noted that only nine plugs or caps are needed to identify nearly all of the valves that are normally used.

f. One valve outlet not mentioned above is found on nitrogen cylinders of the following FSNs:

Table F

8120–247–9614
8120–247–9615
8120–247–9616
8120–286–8592

This is a special military valve with an external right–hand thread. (Note that other nitrogen valves have an internal thread.) This valve (and cylinder) cannot be substituted for or by any other cylinder. Inspection to assure the proper valve outlet for these FSNs is critical.

Section IV
INSPECTION OF CYLINDERS

4.1. General

a. Cylinders will be inspected upon receipt, periodically while in storage, and when they are selected for shipment.

b. Receiving inspection has as its purpose the identification of each cylinder to a valid FSN, proper color coding, and classifying each cylinder to its proper condition code.

c. Periodic inspection will determine changes in condition code, and will verify accuracy of assigned FSNs.

d. Inspection at the time of shipment will verify conformance of the cylinder to the FSN and condition code that were assigned previously, and under which shipment is being made.

4.2. Inspection for Serviceability

a. Improper storage or abuse in service will result in visible deterioration of the cylinder. Also, to be acceptable for storage and reissue, the cylinder must be Government–owned and manufactured in the U. S., regardless of its physical condition.

b. Accordingly, the following characteristics will be evaluated whenever inspection for serviceability is required:

(1) Government Ownership

(a) The cylinder must be identified as Government–owned. Cylinder serial numbers that are prefixed by AF, DA, USA, USN, N or the letters US, USGOVT, US PROPERTY, or the name of a DoD or other Government agency stamped on the cylinder or embossed on the neckring, or a Military or Federal Specification number (see section III, paragraph 3.4 c), on the cylinder, are considered to be evidence of Government ownership.

(b) Cylinders that are not so identified will be placed in Condition Code J or K, as applicable, and reported to DGSC in accordance with section X.

(2) Deterioration and Damage

(a) Inspection for deterioration will consist of a visual examination for the defects listed below. Cylinders with defects that approximate the physical dimensions indicated will be condemned and reported as require by section X.

1. Low Pressure Cylinders (ICC 4A. 4AA, 4B, 4BA, 4BW, 8, and 8AL) will be inspected for the following defects:

a. Corrosion pits in a general corrosion area that exceed a depth of 3/64' or isolated pits not in a general corrosion area that exceed a depth of 5/64'.

b. Dents at the weld must not be more than 1/4' deep or, if the dent does not include a weld, its depth must not be greater than 1/10th of its major diameter.

c. Cuts or gouges more than 1/16' deep.

d. Evidence that the cylinder has been in a fire.

e. Discernible bulges.

2. High Pressure Cylinders (ICC 3A and 3AA) will be inspected for the following defects:

a. Corrosion pits in a general corrosion area that exceed a depth of 1/32', or isolated pits not in a general corrosion area that exceed a depth of 5/64'.

b. Dents that exceed a depth of 1/16', or whose major diameter is more than 32 times the depth.

c. Cuts or gouges more than 1/16', or whose major diameter is more than 32 times the depth.

d. Visible arc or torch burns.

e. Evidence that the cylinder has been in a fire.

f. Discernible bulges.

c. The following cylinders are no longer serviceable, regardless of their physical appearance, and will be condemned upon receipt:

(1) All cylinders that were manufactured by Taylor Division, Cuneo Press. These cylinders may be identified by the symbol cTd, stamped under or near the serial number or hydrostatic test date.

(2) Cylinders that were manufactured by the Taylor–Wharton Iron and Steel Co., during the period 1942–1944, with a service pressure that has been increased from 1800 to 2015 psi. These cylinders have the symbol TW. (The earliest hydrostatic test date is the date of manufacture.)

(3) Cylinders that were not manufactured in the United States. All U. S.–manufactured cylinders will have an ICC specification, e. g., ICC 3A, 1cc 4B, ICC 8, stamped on the shoulder. Cylinders without such markings will be condemned, whether or not Government ownership is indicated.

4.3. Receiving Inspection

a. Thorough and proper inspection of cylinders at the time of receipt is essential to maintain accurate stock records, and to assure that funds are expended properly for both customer returns and new procurement.

b. Incoming cylinders will be classified as Condition Codes A, E, F, H, J, K, or L, as defined in section IX.

c. Cylinders will be reported on DD Form 1599, Report of Item Discrepancy, in accordance with section X, when a discrepancy in the receipt is noted.

d. The characteristics to be checked on incoming cylinders will vary somewhat, depending upon the source from which they are received.

e. New, filled, or reconditioned cylinders from a contractor will be inspected for the following:

(1) Verify count to assure that the quantity is in agreement with the shipping document.

(2) Painting and color coding must be in accordance with contract requirements. In most instances Military Standard, MIL–STD–101, is applicable.

(3) Valves, where required, should be installed wrench–tight, and closed. When valves are not required, each cylinder must have a solid plug screwed wrench–tight into the cylinder opening.

(4) Valve protection caps, when applicable, must be installed On each cylinder.

(5) The valve outlet connection must be proper for the gas indicated, and must have a dust cap or plug when required by the contract.

(6) Cylinders and valves must be free from grease or oil. Care must be exercised in this determination, as antiseize compound may be found where the valve is inserted into the cylinder. This is not considered a defect.

(7) ICC specification, hydrostatic test date, and evidence of Government ownership must be indicated, and must be in accordance with contract requirements.

(8) Cylinders must be labeled or tagged and shipping documents annotated in accordance with the requirements of the contract and the dot.

(9) Normally, the type or amount of gas in filled cylinders is not subject to inspection upon receipt.

f. Certain characteristics, peculiar to reconditioned and/or refilled Government–owned cylinders, require critical evaluation prior to acceptance. In addition to the above, the following will be checked on such cylinders:

(1) Replacement of visibly defective valves, when required by contract.

(2) Proper removal of rust scale prior to painting.

(3) Hydrostatic testing of cylinders that were due for retest.

g. Inspection of customer returns.

(1) All customer return cylinders, regardless of their residual pressure will be classified "EMPTY" and picked up on the depot records and transceived to DGSC/DPSC as FSC 8120 cylinders. DD Form 1599 will be used to report the receipt of customer returns that are identified as 6830/6505 on the Military Standard Requisitioning and Issue Procedures (MILSTRIP) document by the shipping activity. This report will indicate the FSC 6830/ 6505 FSN in block 9 and the actual FSC 8120 FSN under which the cylinders were picked up in block 15. Even though the cylinders may be considered empty for MILSTRIP processing and accounting, they must be labeled or tagged for shipment. if the cylinder is in fact empty (void of any residual pressure) an EMPTY label shall be applied over the previous label. if the cylinder contains any pressure, it will be labeled or tagged identical to a filled cylinder.

(2) All cylinders received as customer returns will be handled, segregated, and stored in the same manner as filled cylinders described in section 5.2 below. Depot personnel must, at all times, recognize the potential of varying amounts of residual gas, up to and including full pressure, in so–called EMPTY cylinders. Bleeding off excess pressure, previously required, is not necessary except in those instances outlined in section VIII.

(3) The following characteristics will be verified before accepting any cylinder as a customer return:

(a) Government ownership (see paragraph 4.2 b 1).

(b) Serviceability (see paragraph 4.2 b 2).

(c) Conformance to the indicated FSN including the proper valve for the gas for which the cylinder is identified.

(4) Cylinders for which Government ownership is not indicated will be set aside in Condition Code K to be reported separately on a DD Form 1599 as explained in section X.

h. Inspection of Redistribution Receipts. Cylinders that are received on redistribution should have been inspected in accordance with the provisions of 4.4 below. Unless discrepancies are obvious, such cylinders may be picked up under the FSN and condition code on which they were shipped. Discrepancies will be reported on DD Form 1599.

4.4. Inspection at Time of Shipment

a. Filled and empty cylinders that are classified as Condition Code A will be inspected thoroughly for all defects as listed above, as they are taken out of stock preparatory to shipment.

b. Empty cylinders in Condition Code A will not be shipped from DSA depots to (Continental United States (CONUS)) activities if their hydrostatic retest is due within three months. Empty cylinders whose hydrostatic retest is due within 6 months or less shall not be shipped to overseas customers. Cylinders that are due for retest within three months will be reclassified to Condition Codes E or F (see section IX) and reported to DGSC.

c. Full cylinders which are physically in satisfactory condition are considered serviceable regardless of their last hydrostatic test date. Filled cylinders for which a hydrostatic retest is overdue or due within six months shall not be shipped to overseas customers.

d. Filled cylinders (PSC–6830) or empty cylinders (FSC–8120) containing a residual positive pressure shall be tagged or labeled in accordance with DOT requirements prior to shipment. Red tags are required for flammable gases; white tags with red print for poisonous gases; and green tags for all other gases.

e. Only empty cylinders with no residual pressure will be tagged or labeled an empty. Normally, only new or contractually reconditioned cylinders may be presumed to be empty. All other cylinders will be locally checked prior to identification as an empty cylinder in accordance with paragraph f below. DPSC managed (medical) FSC 8120 cylinders will not be shipped from DSA Depots unless they are known to be truly empty.

f. All dot shipping tags or labels will be removed from empty cylinders prior to shipment. A white, six–inch square tag with the word EMPTY in one–inch–high black letters will be affixed to empty cylinders.

g. Valves will be closed hand tight and valve protector caps installed, where applicable, on all cylinders prior to shipment.

h. Valve outlet dust caps (or plugs) must be installed on all cylinders being shipped overseas or by air. When available, such caps or plugs should be used for all shipments and will be when specified.

i. Empty propane cylinders, with the exception of new or contractually reconditioned cylinders, that are being transshipped via military airlift require special preparation prior to delivery to the CONUS shipping point. All such cylinders will be emptied completely of their contents, the valves will be removed, and the cylinders will be rinsed first with ethyl alcohol (denatured) and then with water. Cylinders will then be dried with oil free compressed air or nitrogen, and revalved. A tag or label with the notation "PREPARED FOR AIR SHIPMENT IN ACCORDANCE WITH AFM 71–4" will be affixed to each cylinder.

j. In–storage maintenance, as defined in paragraph 6.1, will be accomplished on Condition Code A cylinders prior to shipment when the need is detected as a result of preshipment inspection.

4.5. Periodic Inspection in Storage

a. The physical condition of filled cylinders in *covered* storage generally will not deteriorate sufficiently to warrant a change in condition code. Evaluation of cylinder contents with respect to either quality or amount is not required unless such is requested by DGSC.

b. Cylinders in outside storage can and will deteriorate through rusting, pitting, and degradation of paint. Such cylinders will be inspected every six months and, where necessary, will be reclassified and reported to indicate the change in condition code.

c. All empty cylinders in Condition Code A must be reinspected every six months to determine their status with respect to the hydrostatic test date, unless effective controls are established and maintained, as shown in paragraph 5.5.

Section V
STORAGE AND HANDLING

5.1. General

a. Personnel who handle or use compressed gases or gas cylinders should be trained to recognize the dangers that are associated with the items and the practices in the handling of empty cylinders that could contribute to avoidable degradation of the cylinder condition. Some general rules on handling and use are:

(1) References to gases should be by the proper name of the gas rather than by "air" or "gas".

(2) Safety devices in valves or cylinders shall not be disturbed except as outlined in paragraph 7.2 a. and for replacement.

(3) Compressed gas from cylinders should not be used without

reducing the pressure through a regulator that was designed for that purpose.

(4) When installing a regulator, particular care must be exercised to assure that the threads on the regulator or union are the same as those on the valve.

(5) Prior to installing a regulator, it is good practice to open the cylinder valve 1/4 turn and close immediately to remove any dust or debris that would enter the regulator. Always point the valve opening away from the body, and not toward anyone else.

(6) After the regulator is installed, the opening screw on the regulator should be released before the cylinder valve is opened.

(7) If a valve is difficult to open, the valve opening should be turned away from the operator's body while greater force is applied. Valves that are fitted with handwheels should be operated by hand only; those that require a wrench or key should be operated only with the proper implement; if a wrench or key is used, it should be kept ready for instant use while the cylinder valve is open.

(8) Cylinder valves should be opened slowly to prevent a sudden discharge of gas.

(9) Prior to the removal of a regulator from a cylinder, the cylinder valve should be closed, and all gas should be released from the regulator.

(10) During use, all cylinder valves except acetylene will be opened fully and then closed one–half turn. This will ensure the valve is free for rapid operation should the need arise. Acetylene cylinder valves shall never be opened more than 1 1/2 turns. Usually, 1/2 turn or less is sufficient for welding purpose.

(11) If a valve leak is discovered, the valve must be closed immediately. If the leak persists after closing, the cylinder will be moved outside and, if the gas is toxic or flammable, isolated in an area away from buildings and public roads. The local safety office will be notified immediately.

(12) Should there be a leak between a cylinder and the regulator, the adjusting nut should not be tightened until the cylinder valve has first been closed, and time has been allowed for the gas in the regulator to escape.

(13) When cylinders are not in use, valves will be closed tightly, and the valve protector zaps will be installed.

(14) Gas shall not be transferred from one cylinder to another except as directed by an official military service publication.

(15) Numbers or markings that are stamped on cylinders will not be altered or defaced, nor will additional markings be applied to cylinders, without approval of DGSC.

(16) Compressed gas will not be used to dust off clothing or other objects; serious injury may result.

(17) Except as noted in paragraph 4.4 g, serviceable cylinders should never be emptied completely of their contents. When exhausting excess gas from cylinders, sufficient gas should be retained to assure a positive internal pressure. This procedure is critical for helium cylinders; the Bureau of Mines has Imposed a specific requirement that such cylinders must not be returned for refilling with less than 15 psi internal pressure.

(18) For storage and handling purposes, all cylinders should always be considered full, and corresponding care exercised. They should never be dropped or allowed to be struck by any object; when standing upright during use or storage, precautions will be taken to prevent accidental upsetting or falling.

(19) Cylinders will never be lifted by grasping the valve or valve protection cap, and will never be lifted by slings or electro–magnets.

(20) Cylinders will never be utilized as rollers or supports.

(21) Cylinders should never be used near heat sources where temperatures in excess of 130(F might be encountered. Neither should they be used in areas where heat, slag, or hot metal might be contacted.

5.2. Storage Procedures (General)

a. General purpose warehouse space is preferred for filled and empty cylinders in Condition Codes A and E, with shed space being the second choice. Cylinders will be protected from dampness, and filled cylinders must be protected against excessive rise in temperature from direct rays of the sun or from other sources of heat not to exceed 13O(F. Hazardous gases will be stored only in the end sections of buildings. When it is necessary to store such cylinders in the open, they will be covered with non–combustible or slow–burning material. Tarpaulins that are used for this purpose will be flame–proofed. An air space of at least 18 inches will be provided between cylinders and covers to afford good ventilation. (An exception to covered storage for filled cylinders is chlorine trifluoride. See paragraph 5.3 a 3 (b)). Empty cylinders in Condition Codes F or H may be stored in the open, provided applicable safety precautions as noted herein are observed.

b. Smoking is prohibited within 50 feet of compressed gas storage areas, and "No Smoking" signs will be posted.

c. Filled and empty cylinders should be stored separately. When filled cylinders or "empty" cylinders from which all gas was not exhausted are stored in the same location, the cylinders shall be grouped according to the gases that are contained, and segregated according to the type classification, e. g., flammable, toxic, oxidizing, or physically hazardous. Oxidizing gases must never be stored within 50 feet of flammable gases (red label) or flammable liquids. (See special instructions for handling acetylene, chlorine, and chlorine trifluoride cylinders.)

d. Proper identification and segregation of cylinders by FSN are essential. To be identified properly to a FSN, the cylinder capacity or size (see paragraph 3.2), working pressure (see paragraph 3.1 and 3.3), STANDARD or NON–STANDARD classification (see paragraph 3.4), valve (see paragraph 3.7), and color coding (see paragraph 3.5), must conform to the item description in the Federal Stock Catalog. Filled cylinders in FSC 6830, for which the corresponding FSC 8120 empty cylinder is either not listed or does not conform, will be reported to DGSC in accordance with Section X.

e. It will be noted that in some instances empty cylinders for refrigerant gases (chloro–fluoro–hydrocarbons) may not be stenciled with the name of a gas. Since most of these cylinders are interchangeable for all such gases, the FSC C8120–IL in being revised to identify most of these cylinders under a general description for chloro–fluoro–hydrocarbon refrigerant gases. Except as noted below, all such cylinders conforming to the generalized catalog description within the limits established in paragraph 3.2 b above may be picked up and issued under the applicable FSNs, even if the name of a specific gas is stenciled on the cylinder. The exceptions will be cylinders identified for a specific application as for refrigerant 13 which must have a cylinder with a minimum of 300 psi working pressure. Whenever possible, cylinders conforming to the catalog descriptions for special purpose cylinders will be picked up and carried under the specific FSN. Proper stenciling of the specific cylinder contents shall be required prior to the use of the filled cylinders.

f. Cylinders with valves must always be stored with the valve protector cap securely in place. Except for acetylene, cylinders without provisions for a valve protector cap should be stored horizontally, unless they are crated or palletized and strapped securely.

g. Cylinders that are palletized vertically for storage must also be strapped.

5.3. Procedures for Specific Cylinders

a. Certain gases, because of their hazardous nature or their potential to become so under certain circumstances, require special storage and handling. In addition to the aforementioned general procedures for all cylinders, the following procedures apply to the storage and handling of cylinders that contain the gases listed below.

(1) *Acetylene.* Acetylene cylinders should always be stored in an upright position in a well–ventilated area. Valves on empty cylinders must be closed securely to prevent evaporation of the acetone solvent, also flammable, that these cylinders contain. Acetylene cylinders should never be stored within 100 feet of oxygen cylinders unless separated by an approved firewall. Signs to indicate no smoking or open flames must be posted in and around all areas where acetylene is stored. Filled acetylene cylinders stored within a single

bay of a warehouse or an area of comparable size, will be limited to a total volume of 2000 cubic feet of acetylene. (14.5 cubic feet of acetylene weighs approximately one pound.)

(2) *Chlorine*

(a) As noted previously, chlorine will react violently with many materials, including other gases. Chlorine cylinders should be stored in an area away from other gases, chemicals, paints, solvents, and petroleum products. obviously, the storage area should be well ventilated.

(b) Detection of Leaks in Chlorine Cylinder Valves.

1. When required or suspected, valves in filled chlorine cylinders may be checked for leaks as follows.

a. Using an atomizer type spray bottle (glass or plastic), direct an atomized spray of ammonium hydroxide at the valve from a distance of about 18 inches.

b. If chlorine gas is present, a cloud of white vapor (similar in appearance to that produced by "Dry ice") will be observed, indicating a leaking valve.

2. Ammonium hydroxide, FSN 6810–222–9643, 6810–584–3793, 6810–817–9929, 6810–826–6121 or any commercial ammonia solution (27–30%) may be used for this test with due respect for its effect on the nose, eyes and skin.

3. Since this is a sensitive test, any cylinder giving a positive reaction should be moved to an area known to be free of chlorine from other sources or cylinders and retested.

4. Minor leaks occurring at the valve stem can sometimes be corrected by tightening the packing nut (clockwise), allowing the cylinder to be returned to storage or issue.

5. Leaks at valve outlets should be checked to determine if the valve is effectively closed. If it is, and it still leaks, an outlet cap should be installed wrench tight and the cylinder set aside as a leaker.

6. Leaks of a magnitude that present a personnel hazard may be effectively sealed with a device known as Emergency Kit, Type A, for Chlorine Cylinder Leaks, manufactured by the Indian Springs Manufacturing Company, Baldwinsville, New York. Such leakers should be reported to DGSC immediately.

7. Cylinders with minor leaks (chlorine gas not visible) should be removed to an open area pending disposal in accordance with section VII or VIII.

(c) The procedures in this regulation for chlorine cylinders are limited to those that are identified as ICC 3A or 3AA. Chlorine cylinders that bear any other ICC or other designation will be set aside and reported to DGSC, in accordance with section X.

(3) *Chlorine Trifluoride*

(a) Chlorine trifluoride is the most hazardous item that is cataloged currently in FSC c8120–IL. Personnel who handle cylinders should be alerted to recognize the brown cylinder with a single green band.

(b) Such cylinders, if received, will be isolated immediately in open storage on bare ground or a cement pad, at least 50 feet from anything combustible. The cylinder(s) will be braced in an upright position. (See paragraph 7.2 c.) DGSC will be advised immediately, and will be given the pertinent information as listed in paragraph 10.2.

(4) *Ethylene Oxide*

(a) Ethylene Oxide should not be carried in DSA Depot stock, except for DPSC–managed medical gases. However, cylinders of this material may be received as part of customer returns. The following instructions apply to such cylinders, regardless of the amount of material in them. The amount of material in a cylinder may be determined by weighing the cylinder (without the valve protector cap) and subtracting the tare weight (TW) stamped on the shoulder.

(b) Immediately upon receipt, ethylene oxide cylinders will be removed to a discharge area and emptied of their contents in accordance with section VII. Since ethylene oxide under pressure in a cylinder is mostly in liquid form, extended periods of time will be required to as sure complete evaporation of the liquid. REMEMBER, this gas is highly flammable and toxic. Protective clothing and an appropriate full face mask are required.

(c) When all gas has been evacuated, a rubber or plastic hose will be inserted to the bottom, and the cylinders will be flushed thoroughly with water. Cylinders will be upended and drained, preferably into a large body of water or running water, NEVER into a closed sewage system. Drainage on the ground should be flushed away with large amounts of water.

(d) The empty cylinders will be revalved, and each cylinder, will be stenciled clearly as follows, in one–inch minimum letters: CAUTION: THIS CYLINDER CONTAINS AIR. The empty cylinder may then be returned to stock.

5.4. Protective Equipment.

Gas masks or air pack and protective clothing, if required, will be provided for ready accessibility in the immediate area for each gas that is stored in a particular warehouse location. Gas masks must be of a type appropriate for the kind of gas being stored. Care must be exercised so as not to store the protective equipment in a location that could not be reached in the event that an accidental discharge of gas should occur. Protective equipment will be carried to outside storage sites whenever cylinders are to be handled there.

5.5. Storage Controls

a. All cylinders in Condition Code A must be controlled to assure issuance of older cylinders first, based upon the date of the last hydrostatic test.

b. Procedures will be established locally to detect, reclassify and report Condition Code A cylinders that must be downgraded to Condition Code E because of expiration of the hydrostatic test date.

c. For empty cylinders not exhausted to the atmosphere prior to storage, other than those received on new procurement or from a reconditioning contractor, procedures and controls established in paragraph 5.2 for filled cylinders will also apply to empty cylinders with a positive residual pressure.

Section VI
MAINTENANCE OF CYLINDERS

6.1. General.

In storage maintenance of cylinders will be limited to external cleaning, replacement of valve dust caps or plugs, valve handwheels, and valve protection caps when such actions are all that are required to assign a cylinder to Condition Code A or E.

6.2. Safety Precautions.

Certain precautions must be observed in checking and maintaining cylinders. Solvents that are used for external cleaning of cylinders must not be flammable, and must have minimal toxic characteristics. Perchloroethylene or trichloroethylene, used in a well–ventilated area and with adequate protection for the skin, is recommended. Soap solutions, used frequently to detect leaks around valves, must never be used on the outlet connection of valves in aviator's breathing oxygen service.

6.3. Additional Services.

Maintenance beyond the scope of that indicated above for in–storage maintenance will be performed by commercial contractors or by depot activities as directed by DGSC. Maintenance to be performed by commercial contractors, DSA depot maintenance and/or Military Service maintenance activities, will be coordinated through HQ DSA, ATTN: DSAH–OW (DSAR 4151.8, DSA Depot Maintenance Program).

Section VII
DISPOSAL OF COMPRESSED GASES

7.1. eneral

a. Unless specifically required herein or by local regulations, the

contents of compressed gas cylinders need not be exhausted to the atmosphere prior to shipment, storage, or disposal of a cylinder.

b. The instruction provided herein will apply whenever a cylinder must be discharged of its contents for any reason.

7.2. Discharge of Nontoxic, Nonflammable Gases

a. Gases covered in this regulation which are considered nontoxic and nonflammable that may be released to the atmosphere with only normal safety precautions exercised for gas under pressure are listed below:

Table 7–2

Air, Compressed	Helium
Argon	Nitrogen
Carbon Dioxide	Oxygen
Chloro/fluorohydrocarbons	Sulphur–hexafluoride

A mixed composition of any of the above listed gases and any other gases not listed above will be considered toxic and flammable for disposal purposes. Any gas that is not listed above or in paragraph 7.3 will be considered toxic and flammable for disposal purposes until it is properly identified.

b. Nontoxic, nonflammable gases should be discharged in an open area, i. e., outside a building, or in a well–ventilated shed. Most of these gases will displace air if the discharge is confined.

c. Facilities will be provided to maintain cylinders in an upright position while being discharged. Binding three or more cylinders together by strap, tape, or chain will accomplish this if racks are not available.

d. Cylinders will be discharged by bleeding off the contents slowly over an extended period of time. This will be accomplished by restricting the gas discharge through an orifice rather than attempting to control the valve opening. For most valves, a dust cap or plug, drilled with a 3/32' hole and placed wrench–tight over the valve outlet, will suffice to limit the rate of gas discharge. Some valves may require local adaptation of standard brass fittings to provide this control.

e. If a valve is inoperable, the contents of a cylinder may be discharged by loosening, but not removing, the safety device on the valve or cylinder. Extreme caution is required in this operation to prevent forceful ejection of the safety cap or plug and subsequent uncontrolled discharge of the gas. Personnel will position themselves opposite the safety cap for this method of discharge. Hazardous gases, paragraph 7.3 a, must never be discharged in this manner.

f. When the discharging gas is no longer audible, restricting devices will be removed, and the cylinder valve (or safety vent) will be opened fully.

7.3. Disposal of Hazardous Gases

a. Hazardous gases that are covered by this regulation include both toxic and flammable gases; a listing of these is provided below.

Table 7–3

	Toxic Gases		Flammable Gases
2/	Ammonia		Acetylene
	Chlorine		Butane
2/	Chlorine Trifluoride		Propane
2/	Carbon Monoxide	3/	Ethylene oxide
	Methyl Bromide		Hydrogen
	Sulfur Dioxide		MAPP Gas
		3/	Methyl Chloride

2/ These gases are also flammable.
3/ These gases are also toxic.

b. In addition to the procedures in the preceding paragraph, additional precautions are required when discharging hazardous gases.

c. The area that is selected for the discharge of flammable or toxic gases must be at least 500 feet from buildings or public roads, and should be cleared of debris and natural growth. A cement pad is preferable to bare ground. An asphalt surface will not be used.

d. Hazardous gases must not be discharged during inclement weather, or during periods of zero wind velocity. Wind direction must be reasonably constant, and should not be blowing toward inhabited buildings within one–half mile of the point of discharge, except as noted specifically below.

e. The area in which such gases are to be discharged will be placarded to restrict transient or unauthorized personnel.

f. Hazardous gases must be vented through a throttled valve as described in paragraph 7.2 d. Use of the safety device to release pressure on a hazardous gas cylinder is prohibited. Procedures for handling cylinders that cannot be discharged are described in section VIII.

g. During the actual handling of cylinders in the discharging area, at least two qualified persons and a vehicle (parked upwind not less than 150 feet away) will be available. Telephonic or radio communication with local safety, fire, or security offices is highly desirable.

h. Dissimilar gases should not be discharged simultaneously.

i. All of the toxic and flammable gases that are likely to be encountered in depots, except hydrogen, have a characteristic odor and, in some instances, color. If an odor or color is detected on releasing pressure from a cylinder that is not identified as being toxic or flammable, the valve will be closed immediately, and the cylinder will be handled as indicated in paragraph 7.3 for hazardous gases.

7.4. Disposal of Toxic Gases

a. Toxic gases will not be released to the atmosphere in violation of Federal, State, or local air pollution regulations. Where no regulations are in effect, venting may be conducted in accordance with the strict controls and environmental conditions as set forth in the preceding sections. The assistance of local industrial hygiene engineers, bioenvironmental engineers, or safety office, may be sought to establish detailed procedures for releasing toxic materials into the atmosphere.

b. The rate of discharge will be limited to assure sufficient dilution in the atmosphere as the gas moves downwind. Except for ammonia and carbon monoxide, the toxic gases referenced herein are heavier than air. Adequate dispersion requires a reasonably strong wind (4 – 5 miles per hour (mph), blowing consistently in the desired direction. No more than two cylinders of a toxic gas will be discharged at one time.

c. During any operations that involve the release of toxic gases, personnel will be protected by a full face gas mask, approved by the U. S. Bureau of Mines, and conventional clothing (see ethylene oxide and chlorine) to cover the head, arms, hands, body, and legs. Additional information on the characteristics of, and precautions for, a specific gas may be obtained from the local safety office or the nearest municipal Department of Health.

d. Further instructions on the disposal of specific toxic gases are noted, below:

(1) *Chlorine Trifluoride.* Chlorine trifluoride will not be discharged to the atmosphere by DSA Depot personnel. Cylinders of chlorine trifluoride received at DSA Depots and DSA support depots will be handled as indicated in section V.

(2) *Chlorine*

(a) Chlorine, even in light concentrations, can cause serious injury to the eyes, nose, throat, lungs, and moist areas of the body. In addition to the obvious requirement for a suitable gas mask or self–contained breathing apparatus approved by the U. S. Bureau of Mines, full protective clothing will be worn when discharging chlorine.

(b) As an alternate to discharging the contents of chlorine cylinders with significant amounts of residual pressure, the cylinders can be offered to local military installations for use in water treating system, with the proviso that empty cylinders will be returned to the custody of the depot.

(c) Chlorine is loaded into cylinders as a liquid. Valves on chlorine cylinders must never be opened unless the cylinder is standing upright to prevent the discharge of liquid.

(3) *Ammonia*

(a) Ammonia gas has toxic and irritating characteristics that are comparable to chlorine and sulfur dioxide. Also, under certain circumstances, ammonia is flammable, and precautions for flammable gases will be observed during its discharge.

(b) Owing to the rapid rate at which ammonia disperses in air, all condemned cylinders of ammonia may be emptied of their contents prior to processing to the PDO. This will be accomplished as described in paragraph 7.3, except that the restriction of one–half mile from inhabited buildings does not apply.

(c) CAUTION: Ammonia is also charged into cylinders as a liquid. Valves on ammonia cylinders must never be opened unless the cylinder is standing upright.

(4) *Carbon Monoxide.* Carbon monoxide is also readily dispersed in air. However, owing to the explosive and toxic characteristics of this gas, additional precautions as required for flammable gases will be observed during the discharge of carbon monoxide. Workers in the immediate area should always wear an absorbent mask or air pack when carbon monoxide is discharged.

(5) *Sulfur Dioxide*

(a) Sulfur dioxide is subject to all of the precautions that apply when discharging toxic gases. In addition, since sulfur dioxide may exist as a liquid in a cylinder, the precautions noted above for chlorine and ammonia must also be observed.

(b) In addition, and particularly during warm weather, care must be taken to prevent this gas from coming on contact with moist areas of the body, or clothing wet with perspiration. Irritating, though not generally serious, burns may result.

7.5. Disposal of Flammable Gases

a. In addition to the procedures that have been prescribed previously for discharging hazardous gases, the obvious precaution of avoiding sources of ignition will be observed strictly when venting flammable gases to the atmosphere.

b. Properly controlled, flammable gases may be vented to the atmosphere without undue risk. However, it is recommended that downwind areas such as roads, buildings And work compounds be checked periodically for explosive atmosphere. Various devices, such as the Mine Safety Appliance "Explosimeter," are usually available for this purpose in the local safety office.

c. Additional information on specific flammable gases is provided below:

(1) *Acetylene*

(a) Acetylene, shipped in cylinders identified as ICC 8 or 8AL, is not a true compressed gas. These cylinders contain a porous packing material that is saturated with acetone, a flammable solvent, in which acetylene is dissolved under its own pressure. Consequently, "empty" acetylene cylinders, a. having no residual pressure, must be handled with due respect for the flammable vapors of acetone that may be emitted over a long period of time after the acetylene pressure has been exhausted. Empty acetylene cylinders must always be stored or shipped vertically, with the valves closed securely.

(b) This characteristic does not affect the shipment of acetylene cylinders as "empty," even though the acetone solvent may still be present. Owing to the limited quantity of acetone that is involved, such cylinders are not regulated as dangerous for shipment.

(c) Acetylene may be discharged safely by observing all of the preceding precautions.

(2) *Propane, Butane, and MAPP Gas*

(a) These gases in sufficient concentrations also have an anesthetic effect. Personnel who handle or discharge these gases should be alert to this possibility. Fresh air is normally sufficient to overcome any feeling of drowsiness that might be experienced.

(b) Adherence to procedures for hazardous, flammable gases will permit safe discharge of these gases.

(3) *Ethylene Oxide*

(a) Ethylene oxide is the most hazardous of the flammable gases and is also one of the more toxic. Extreme caution is required when handling or discharging this gas. However, every effort within the restrictions that are imposed for hazardous gases should be made to empty ethylene oxide cylinders prior to shipment or release to the PDO.

(b) Procedures for disposal of ethylene oxide are described in paragraph 7.3 and in section V, except that if the cylinder is to be released to the PDO, the CAUTION stencil need not be applied.

(c) CAUTION: Ethylene oxide liquid that is spilled on clothing or bare skin can cause severe burns unless the clothing is removed promptly, and the parts of the body that come in contact with the liquid are washed thoroughly. Overgarments of rubber are required whenever there is a possibility of contact with liquid ethylene oxide.

(4) *Hydrogen*

(a) Hydrogen in the presence of oxygen (the atmosphere) is the most sensitive of the flammable gases. Fortunately, it is dissipated so rapidly on being released to the air that, unless it is confined in some way, an explosive mixture is not developed. Keeping sources of possible ignition away from the discharging cylinder is normally sufficient to preclude an accident.

(b) The restriction of not venting hazardous gas with the wind blowing in the direction of inhabited buildings within one–half mile does not apply to hydrogen.

(5) *Methyl Chloride*

(a) Methyl chloride is moderately toxic, but is critical when exposure is repetitive or in very high concentrations. A gas mask is required if the possibility of frequent or prolonged exposure exists.

(b) When venting methyl chloride to the atmosphere, extreme caution is required to prevent the discharge from coming in direct contact with the skin. The rapid cooling effect can produce severe "cold" burns.

(c) Methyl chloride may be vented safely to the atmosphere in accordance with all procedures for hazardous, flammable gases.

7.6. Disposal of other Gases

a. Except for the gases that are listed specifically in paragraphs

7.3 through 7.5 as hazardous, other gas cylinders (except, see section I) may be vented to the atmosphere in accordance with paragraph 7.2.

b. However, certain characteristics of some gases that are likely to be encountered are listed below for information and appropriate action.

(1) *Refrigerants.* The chloro–fluorohydrocarbons and carbon dioxide under pressure produce a cooling effect when released through a valve. Under certain circumstances these gases will cause a "cold" burn if they impinge upon the bare skin.

(2) *Oxygen.* Oxygen must always be handled with respect for its ability to accelerate combustion. A cigarette, for instance, may burst into a sizeable flame in an oxygen atmosphere. Many substances that would not otherwise burn will do so in pure or nearly pure oxygen. Precautions to preclude accidents as a result of this characteristic will be observed when discharging oxygen.

(3) *Nitrous Oxide*

(a) While not generally considered a hazardous gas, nitrous oxide is an effective anesthetic. In concentrations of about 35 percent and above in air, it will cause unconsciousness.

(b) Also, when subjected to electrical arcing or open flame temperatures, it may become an oxidizing agent and will support combustion. Handle accordingly.

(c) No problems should be encountered if the gas is handled in accordance with procedures in this regulation.

Section VIII
DISPOSAL OF COMPRESSED GAS CYLINDERS

8.1. General

a. Disposal of compressed gas cylinders will be made in accordance with the provisions of the DoD 4160.21–M, Defense Disposal Manual, and the procedures delineated in this regulation.

b. Cylinders in the DSA inventory may be shipped to Property Disposal Office (POO) for any of the following reasons:

(1) Cylinders that have been condemned for physical defects. (See paragraph 4.2 b 2)

(2) Cylinders returned from a fill or repair contractor indicating failure to pass the hydrostatic test.

(3) Foreign made cylinders and certain U. S. manufactured cylinders as explained in paragraph 4.2 c.

(4) Cylinders whose dimensions and/or capacity cannot be related or converted to a valid Federal Stock Number.

(5) Cylinders declared excess/surplus to known or anticipated requirements of the Government.

(6) Cylinders designated as "nongovernment–owned", (see paragraph 4.2 b 1) when so directed by the Managing Activity.

c. Cylinders on hand that are unacceptable for use in Government service, (reasons 1 thru 3 above), need not be referred to the DSA Managing Activity for disposition. Depot personnel will initiate the transfer of such cylinders to PDO and report such actions to the cognizant Managing Activity in accordance with DSAM 4140.2, Volume I, and the provisions of section X of this regulation.

d. Cylinders reported to a DSC for identification to an FSN, or for designation of ownership, and cylinders declared excess/surplus will be disposed at the direction of the Managing Activity.

8.2. Shipment of Cylinders to PDO

a. Cylinders transferred from a storage or supply activity to Property Disposal will be tagged or labeled to indicate the status of the cylinder, e. g., condition, full or empty. Where condition is questionable, all cylinders will be assumed to contain pressure and will be handled accordingly.

b. Cylinders of hazardous gases (see paragraph 7.3 a) will be identified and handled as "full" cylinders unless it is known or determined that they do not contain a positive pressure. Cylinders that have been reconditioned (but not refilled) and those returned from a filling contractor as condemned may be presumed to be empty.

c. Cylinders will be segregated and palletized according to types of gas indicated in section V. Known empty cylinders may be commingled.

d. Valve protector caps will be installed on all cylinders having a threaded neckring or spud. Valves in cylinders not having provisions for a cap will be protected by crating or palletizing in a horizontal position securely held by strapping.

e. Cylinders which have been condemned for physical defects or failure to pass a hydrostatic test will be identified by affixing to the cylinder valve a red tag, DD Form 1577 (available through normal supply channels), with the legend "CONDEMNED" clearly stamped or printed thereon which will completely describe the reason(s) for disposal action.

8.3. Handling of Cylinders in the PDO Area

a. Segregation and storage of compressed gas cylinders in the PDO area will be in accordance with the applicable procedures delineated in section V of this regulation, except that outside storage for all cylinders is permitted.

b. Cylinders bearing a dot warning label or tag will be considered and handled as a "full" cylinder. Such cylinders will be protected from direct sunlight if such exposure will result in a measured or anticipated cylinder wall temperature of 130° F or higher.

8.4. Special Provisions for the Disposal of Government–owned Cylinders

a. Disposal of compressed gas cylinders by public sale will be in accordance with the requirements of the Defense Disposal Manual, DOD 4160.21–M paragraphs 3–VII–F3a, 3–VII–F3c, and 3–XV–B1O.

b. Government–owned cylinders may be offered for sale as used, surplus property in an "as is" condition, except leakers. Contracts or agreements for sale of such cylinders will contain a clause reading essentially as follows:

(1) Purchasers are warned that these cylinders may contain gas of an explosive or toxic nature notwithstanding the care exercised by the Government to remove them or render the material harmless. The Government assumes no liability for damages to the property of the Purchaser or for personal injuries or disabilities to the Purchaser or the Purchaser's employees or to any other person arising from or incident to the purchase of cylinders or their use or disposition by the Purchaser. The Purchaser shall hold the Government harmless from any and all such demands, suits, actions, or claims of whatsoever nature arising from or out of the purchase of cylinders.

(2) Purchasers are warned that prior to reuse of Government cylinders for transporting compressed gases or resale of the cylinders, the registered Government symbol will be obliterated and the registered symbol of the current owner or user will be stamped on the cylinder shoulder. The new cylinder identification that results will be reported to:

Association of American Railroads
Bureau of Explosives
2 Pennsylvania Plaza
New York, New York 10001

In addition. the contractor agrees that any cylinder obtained from the Government will not be reused by him for transportation of compressed gases unless it meets the requirements of the hazardous materials regulation in section 173.34, Title 49, Code of Federal Regulations and the serviceability criteria of the Compressed Gas Association Pamphlet C–6.

c. Only serviceable (i. e., not condemned) cylinders will be made available for transfer to another Government agency or for donation to an eligible donee. Cylinders coming under the categories shown in paragraph 8.1 b 1, 2, 3, 4, and 6 will not be transferred or donated.

Section IX
CLASSIFICATION OF CYLINDERS IN CONDITION CODES IN ACCORDANCE WITH DSAM 4140.2, VOLUME I

9.1. All cylinders will be classified by condition code by visual

inspection at the time of receiving, and reclassified, if necessary, as they are inspected for shipment.

9.2. Classification of cylinders will be limited to the condition codes as cited below, in accordance with the following criteria:

a. Condition Code A

(1) Only cylinders that are suitable for issue without further repair or maintenance, or those that can be rendered so by normal in storage maintenance, will be assigned to Condition Code A.

(2) Except as noted below, empty cylinders, i. e., those without residual pressure, must be inspected internally with a droplight for loose or flaky rust, moisture or other contaminants, prior to shipment direct to a using activity as Condition Code A cylinders. Cylinders that are shipped to or through a filling contractor need not be inspected internally by the depot.

(3) Internal inspection will not be made on cylinders that are identified to a toxic gas (see paragraph 7.3 b) or on cylinders stamped ICC 8 or 8AL.

(4) The droplight used for the inspection of flammable gas cylinders, other than those also designated TOXIC in paragraph 7.3 b above, must be of explosion–proof construction. As an alternate to a droplight, a mirror which is illuminated by an outside source of light may be used to reflect light into the cylinder.

(5) Cylinders that are found to be unsatisfactory on internal inspection will be tagged or marked as requiring internal cleaning, and will be assigned to Condition Code F.

b. Condition Code E

(1) Condition Code E will be utilized to identify empty cylinders that have exceeded their hydrostatic retest date (see paragraph 3.6), but that require no other repairs or maintenance.

(2) The principal application of this condition code will be to report Condition Code A cylinders in depot storage that must be downgraded to unserviceable solely because of expiration of the hydrostatic retest date. Incoming cylinders will rarely meet these criteria.

c. Condition Code F. Cylinders that require maintenance beyond the scope of in storage maintenance as defined in Section VI will be assigned to Condition Code F.

NOTE: Condition Codes E and F as described above are not to be considered "suspense" conditions. Cylinders that are assigned to either of these condition codes will be maintained as such until instructions for maintenance or shipment are received from DCSC.

d. Condition Code H. Cylinders with any of the physical defects as listed in paragraph 4.2 b 2 or as described in paragraph 4.2 c will be assigned to Condition Code H and released to the PDO in accordance with DOD 4160.21–M, and Section VIII of this Enclosure. Such cylinders will not be referred to DGSC for disposition.

e. Condition Codes J and K

(1) Condition Codes J and K will be used as noted below when a cylinder cannot be identified to a valid FSN, or when ownership, i.e., Government or industry, is in question. In other than these circumstances, cylinders normally require only visual examination by depot personnel to establish the condition code. This should be accomplished within the time and in the manner prescribed by DSAM 4140.2, Volume 1, and the following section of this Enclosure.

(2) Condition Code J will be used only to suspend cylinders that are found in depot stock and that cannot be identified to a valid FSN, or when the Government's ownership of the cylinder is in question. (See paragraph 4.2 b 1 above.)

(3) Condition Code K will be used to report cylinders that are received on a station return or as a result of redistribution when the cylinders do not conform to the FSN as indicated on the shipping document.

f. Condition Code L

(1) New, filled or reconditioned cylinders will be assigned to Condition Code L only when the discrepancy results from noncompliance with the terms of the contract, or when it involves damage in transit.

(2) Frequently, a contractor will return Government–furnished cylinders as unsuitable for rehabilitation or refilling. This should not be reported as a discrepancy against "NEW PROCUREMENT." Such cylinders will be assigned Condition Code H and reported in accordance with DSAM 4140.2, Volume I, and paragraph 9.2 d above. DD Form 250, Materiel Inspection and Receiving Report, and DD Form 1155, Order for Supplies or Services, will serve to document the number of cylinders received.

(3) When Government–furnished valves are returned by a cylinder servicing or filling contractor as unsuitable for further use, they will be considered as scrap, and will be processed through the PDO as such. No report of this action will be made to DGSC.

9.3. Condition codes that are reported to DGSC must conform to those in DSAM 4140.2, Volume 1. General Services Administration or Military Service codes will not be used in any of the reports listed below.

Section X
REPORTING RECEIPTS OR INVENTORY ADJUSTMENTS

10.1. General

a. Receipt and inventory adjustment transactions on compressed gas cylinders will be reported to DGSC in accordance with DSAM 4140.2, Volume I, DSAR 4140–55, Reporting, Adjusting and Accounting for Item Discrepancies in Shipments, and the specific provisions and/or exceptions of this regulation.

b. Distribution Depots will establish internal controls to assure and verify transmittal of DD Form 1486, Pre–positioned Materiel Receipt Card, and DD Form 1487, Materiel Adjustment Document, that result from disposition instructions provided by this regulation.

c. The following reports will be used under the circumstances indicated, and will provide the specific information required herein in addition to that imposed by the applicable directive. Failure to provide this information will result in the return of the report for proper completion.

10.2. DD Form 1225, Storage Quality Control Report

a. Insofar as, compressed gas cylinders in FSC 6830 and FSC 8120 are concerned, DD Form 1225 will be used only to report cylinders on hand, in storage, that must be reclassified to Condition Code J for the reasons noted above in paragraph 9.2, or when requested by DGSC.

b. The DD Form 1225 that is used to report cylinders in Condition Code J will contain the following information for each cylinder in Block 39 of the form or on the reverse side of the report.

(1) The ICC number and rated pressure as stamped on the cylinder.

(2) Color coding, reported as indicated in FSC C8120–IL, Reference Drawing Group 39.

(3) Height and diameter of cylinder, measured to the nearest 1/4 inch.

(4) Evidence of ownership (see paragraph 4.2 b 1).

(5) Date of manufacture (the earliest hydrostatic test date as stamped on the cylinder).

(6) Shatterable or nonshatterable classification of each cylinder (see paragraph 3.4).

c. A DD Form 1225 will not be forwarded when compressed gas cylinders in storage are reclassified to Condition Codes E, F, or H. This provision is an exception to DSAM 4140.2, Volume I. Transmittal of DD Form 1348M, DAC Card is, therefore, essential to assure adjustment of inventory records.

10.3. DD Form 1599, Report of Item Discrepancy

a. DD Form 1599 will be used to report discrepancies in cylinders that are received under the following conditions:

(1) From military activities returning empty cylinders as excess property if the discrepancy exceeds a value of $100 and is the responsibility of the shipper (see paragraph 10.3 b, below).

(2) Receipts from redistribution, if the value of the discrepancy exceeds $10 and is the responsibility of the shipper (except GSA, see paragraph 10.4, below).

(3) Receipts from contractors or vendors that involve overage,

shortage, or damage for which the contractor is apparently responsible.

(4) Receipts with any of the following discrepancies:

(a) Improper item identification.

(b) Incorrect or missing documentation.

(c) When cylinders appear to have been received in error, i.e., intended for another installation or shipped without proper authority.

(d) For any discrepancy not otherwise specifically noted herein if it appears that the shipper is responsible.

b. Customer returns are usually identified by the shipper as being in Condition Code A. Reassignment of cylinders upon receipt to Condition Codes E or F does not of itself require submission of a DD Form 1599. However, if any of the cylinders that are received on a customer return are assigned to Condition Codes K or H, all cylinders on such receipts will be reported in the condition codes under which they are picked up.

c. Cylinders that are reported in Condition Code K must be described fully as required by paragraph 10.2 b, above.

10.4. Standard Form 361, Discrepancy in Shipment Report.

Standard Form 361 will be used, in accordance with DSAR 4140.55, to report all discrepancies in receipts that are attributable to the carrier, and to report discrepancies in receipts from GSA depots.

Section
MEDICAL GASES AND GAS CYLINDERS UNDER MANAGEMENT OF DPSC

Section I
GENERAL

1.1. Gases for medical use are shipped in the same type of steel cylinders as other compressed gases, and use similar valves and valve protection caps. Medical cylinders can be distinguished by the letters "MED" stamped on the shoulder of the cylinder and/or the word "MEDICAL", or "USP", where indicated, stenciled on the cylinder after the name of the gas on two diametrically opposite locations parallel to the longitudinal axis of the cylinder.

1.2. The procedures in Enclosure 1 apply also to medical gases, and constitute the procedures for the proper color coding, storage, handling, inspection, maintenance, and shipment of medical gases. Requirements for reports to DGSC, as shown in Enclosure l, will apply also for medical gases and cylinders, these reports being forwarded to DPSC. Some supplementary instructions for medical gases are desirable, and they are outlined in this Enclosure. All cylinders (both empty and filled), managed by DPSC, shall meet pressure and all other requirements of the applicable specifications.

Section II
PROCEDURES

2.1. Storage and Handling

a. The types of the principal medical gases and precautions as to storage and handling are as follows:

(1) *Oxidizing Gases.* Oxygen, Helium–Oxygen, Nitrous Oxide; these gases support combustion. Because of the danger of fire and explosion, precautions should be taken to ensure that cylinders of these gases will not be stored or handled near cylinders of flammable gases, and that storage areas will be well ventilated.

(2) *Flammable Gas.* Cyclopropane; should not be stored or handled near oxygen or oxidizing gases, or anywhere in the vicinity of a flame or possible sparks. Storage area should be well ventilated.

(3) *Inert Gases.* Carbon Dioxide and Nitrogen; these gases present no fire hazard. Carbon Dioxide, if blown directly on the body, will cause a burn.

(4) *Toxic Gas.* Ethylene Oxide Dichlorodifluoromethane; this gas is mildly toxic. Prevent spraying on hands, face, eyes, or other skin areas. If inhaled sufficiently, it may cause headache or nausea.

b. The maintenance of the purity of medical gases is of utmost importance. These gases should never be transferred from one cylinder to another.

2.2. Inspection – Filled Cylinders.

Inspection of filled medical gas cylinders consists of receiving inspection, storage inspection, and inspection at time of shipment. Inspection for refilled medical gas cylinders (after refurbishing) will be accomplished at the suppliers plant. Filled cylinders, ready for issue and use will bear the tag as required by the DPSC contract to indicate that the cylinders are full. In addition, oxygen–filled cylinders will bear DD Form 1191, Warning Tag for Medical Oxygen Equipment.

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